

**WHAT IS CLAIMED IS:**

1. A scanning system for scanning the surface of a sample, comprising:
  - (a) a scanning head;
  - (b) a mounting arrangement configured for mounting the sample thereon;
  - (c) a drive mechanism configured for providing relative motion between said scanning head and said mounting arrangement;
  - (d) an optical system, at least part of said optical system being included in said scanning head; said optical system being configured for simultaneously reading from at least two non-overlapping viewing regions of the surface; and
  - (e) an adjustment mechanism configured for adjusting at least part of the optical system so as to vary a spacing of said at least two non-overlapping viewing regions read by said optical system.
2. The system of claim 1 wherein:
  - (a) said scanning head includes at least two objective lenses, each of said at least two objective lenses being uniquely associated with one of said at least two non-overlapping viewing regions; and
  - (b) said adjustment mechanism is configured so as to vary the spacing of said at least two objective lenses.

3. The system of claim 1 wherein said optical system is configured for simultaneously reading from at least three non-overlapping viewing regions of the surface.

4. The system of claim 3 wherein said adjustment mechanism is configured to maintain substantially equal spacing among at least three non-overlapping viewing regions.

5. A method for scanning a surface of a sample using a scanning system, the scanning system having a scanning head configured to perform a scanning motion relative to the surface, the scanning system having an optical system, at least part of the optical system being included in the scanning head, the optical system being configured for simultaneously reading from a plurality of non-overlapping viewing regions of the surface, the method comprising the steps of:

- (a) adjusting at least part of the optical system so as to vary a spacing of the non-overlapping viewing regions read by the optical system; and
- (b) providing relative movement between the scanning head and the surface.

6. The method of claim 5, further comprising the step of simultaneously reading from at least three of the non-overlapping viewing regions of the surface.

7. The method of claim 5 wherein said step of adjusting is performed by adjusting at least part of the optical system so as to vary a spacing of at least three of the non-overlapping viewing regions read by the optical system such that said non-overlapping viewing regions are substantially equally spaced.

8. A method for scanning a surface having a periodic pattern, the periodic pattern having a vector of periodicity, the method comprising the steps of:

- (a) simultaneously reading from a first viewing region of the surface and a second viewing region of the surface so as to generate a first image of at least part of said first viewing region and a second image of at least part of said second viewing region, said first viewing region and said second viewing region being spaced substantially by a first integer multiple of said vector of periodicity, an area of said first viewing region being a minority of an area of the pattern, an area of said second viewing region being a minority of said area of the pattern; and
- (b) comparing at least part of said first image and at least part of said second image.

9. The method of claim 8, wherein:

- (a) said step of simultaneously reading is performed by simultaneously reading from said first viewing region of the surface, said second

viewing region of the surface and a third viewing region of the surface so as to generate said first image, said second image and a third image of at least part of said third viewing region;

- (b) said second viewing region and said third viewing region being spaced substantially by a second integer multiple of said vector of periodicity;
- (c) an area of said third viewing region being a minority of an area of the pattern.

10. A method for scanning a surface of a sample using a scanning system, the surface having a periodic pattern, the periodic pattern having a first vector of periodicity, the scanning system having a scanning head configured to perform a scanning motion relative to the surface, the scanning system having an optical system, at least part of the optical system being included in the scanning head, the optical system being configured for simultaneously reading from a plurality of non-overlapping viewing regions of the surface, said non-overlapping viewing regions being spaced by a translation vector, the method comprising the steps of:

- (a) positioning the optical arrangement and the sample in relation to each other, such that, the translation vector is aligned substantially parallel to the first vector of periodicity;

- (b) adjusting the optical arrangement, such that, a length of the translation vector is substantially equal to an integer multiple of a length of the vector of periodicity;
- (c) simultaneously reading from the first viewing region and the second viewing region;
- (d) comparing at least part of a first image of at least part of the first viewing region and at least part of a second image of at least part of the second viewing region; and
- (e) providing relative movement between the scanning head and the surface in a direction which is substantially perpendicular to the first direction of periodicity.

11. The method of claim 10, wherein said step of simultaneously reading is performed by simultaneously reading from said first viewing region, said second viewing region and a third viewing region of the surface.